

CLAIMS

1. A two piece unitary piston being adapter
for use with an engine, said two piece unitary piston
comprising:

5 a head member being made of a material
having a preestablished material strength, having a
crown portion to which is connected a ring band
portion defining a bottom surface and having a support
10 portion defining a mating surface having a
preestablished surface area;

15 a skirt member being made of a material
having a preestablished material strength being
substantially the same as the preestablished material
strength of said head member, having a ring band
support surface being aligned with the bottom surface
and having a top surface being aligned with said
mating surface;

20 said head member and said skirt member being
joined forming said two piece unitary piston, said
joining being at the interface of said bottom surface
and said mating surface, and said ring band support
surface and said top surface respectively; and

25 said joining being formed by an inertia
welding process.

2. The two piece unitary piston of claim 1
wherein each of said head member and said skirt member
are made of steel.

30 3. The two piece unitary piston of claim 2
wherein each of said head member and said skirt member
are formed as a forging.

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4. The two piece unitary piston of claim 2 wherein said head member is formed as a forging and said skirt member is formed as a casting.

5 5. The two piece unitary piston of claim 2 wherein said head member is formed as a casting and said skirt member is formed as a forging.

10 6. The two piece unitary piston of claim 1 wherein said interface of said bottom surface and said ring band support surface being radially spaced from said interface of said mating surface and said top surface.

15 7. The two piece unitary piston of claim 6 wherein said bottom surface and said ring band support surface being axially spaced from said interface of said mating surface and said top surface.

20 8. The two piece unitary piston of claim 7 wherein said head member defining a combustion side and said interface of said mating surface and said top surface being closer thereto than said interface of said bottom surface and ring band support surface.

25 9. The two piece unitary piston of claim 1 further comprising a piston cooling gallery.

30 10. The two piece unitary piston of claim 9 wherein said piston cooling gallery includes a head ring cooling gallery being positioned within said head member and a skirt member cooling gallery being positioned within said skirt member.

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11. The two piece unitary piston of claim 9 wherein said piston cooling gallery includes a coolant inlet and a coolant outlet.

5 12. A method of making a two piece unitary piston, said method of making comprising the steps of:
piston, said method of making comprising the steps of:
positioning a head member within a first
chuck member;
10 centering said head member about a central
axis;
positioning a skirt member within a second
chuck member;
15 centering said skirt member about said
central axis;
rotating at least one of said first chuck
member having said head member centered on said axis
and said second chuck member having said skirt member
centered on said axis; and
20 moving at least one of said first chuck
member and said second chuck member axially toward the
other;
interfacing said head member with said skirt
member; and
25 forcing at least one of said head member
into heat generating contact with said skirt member.

30 13. The method of making said two piece
unitary piston of claim 12 wherein said step of
centering said head member about said central axis
includes adjusting a plurality of jaws of said first
chuck member.

14. The method of making said two piece
unitary piston of claim 12 wherein said step of
centering said skirt member about said central axis
includes adjusting a plurality of jaws of said second
5 chuck member.

15. The method of making said two piece
unitary piston of claim 12 wherein said step of
positioning said head member within said first chuck
10 member includes said head member being at least
partially premachined.

16. The method of making said two piece
unitary piston of claim 12 wherein said step of
positioning said skirt member within said first chuck
15 member includes said head member being at least
partially premachined.

17. The method of making said two piece
20 unitary piston of claim 12 wherein said step of
rotating at least one of said first chuck member
having said head member centered on said axis and said
second chuck member having said skirt member centered
on said axis includes rotating said first chuck
25 member.

18. The method of making said two piece
unitary piston of claim 12 wherein said step of
rotating at least one of said first chuck member
30 having said head member centered on said axis and said
second chuck member having said skirt member centered
on said axis includes rotating said second chuck
member.

19. The method of making said two piece
unitary piston of claim 12 wherein said step of moving
at least one of said first chuck member and said
second chuck member axially toward the other includes
5 axially moving said first chuck member.

20. The method of making said two piece
unitary piston of claim 12 wherein said step of moving
at least one of said first chuck member and said
10 second chuck member axially toward the other includes
axially moving said second chuck member.